CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

1. A measurement system comprising:

A sensor unit configured to capture the profile of an object within a predetermined work zone and output data representative of said object; and

A control unit for receiving and processing data received from said sensor chassis.

2. The measurement system of claim 1 wherein said sensor chassis comprises at least two contour sensors, each aligned with said work zone so that an object within said work zone is at least partially within the field of view (FOV) of one or more of said contour sensors.

3. The measurement system of claim 2 wherein said contour sensors are aligned with said work zone, so as to allow for the collective capture of substantially a 360° view of an object within said work zone.

4. The measurement system of claim 1 wherein said sensor unit comprises four contour sensors, each aligned with said work zone so as to capture a view of an object within said work zone.

5. The measurement system of claim 4 wherein said contour sensors are aligned so as to allow for the collective capture of a substantially 360° view of an object within said work zone.

6. The measurement system of claim 5 wherein said contour sensors are radially aligned with said work zone substantially at the center.

7. The measurement system of claim 6 wherein said contour sensors are radially aligned at 90° intervals about the work zone.

8. The measurement system of claim 2 wherein each of said contour sensors comprises an illumination unit for generating and outputting a light beam of a predetermined wavelength, and a detector unit responsive to light of said predetermined wavelength.

9. The measurement system of claim 8 wherein each of said contour sensors comprise a "sheet of light" contour sensor.

10. The measurement system of claim 8 wherein each of said contour sensors comprise a flying spot time of flight contour sensor.

11. The measurement system of claim 1 wherein said sensor chassis is configured to allow said contour sensor to be rotatably adjusted about said work zone.

12. The measurement system of claim 1 wherein said control unit comprises a visualization module for generating data to cause textual or graphical information to be displayed on an associated display device.

13. The measurement system of claim 1 wherein said control unit comprises a measurement module for carrying out a predetermined measurement.

14. The measurement system of claim 13 wherein said measurement module is further configured to calculate the distance between features of a profile based upon identified control points.

15. The measurement system of claim 13 wherein said measurement module is further configured to calculate an angle of a feature in a profile based upon two identified line segments.

16. The measurement system of claim 13 wherein said measurement module is further configured to determine variance between a profile and a predetermined profile reference.

17. The measurement system of claim 13 wherein said measurement module is further configured to determine the radius and center point of an arc.

18. The measurement system of claim 1 wherein said control unit further comprises a registration module for establishing a correlation between a first coordinate system and a second coordinate system.

19. The measurement system of claim 18 wherein said first coordinate system comprises a sensor coordinate system and said second coordinate system comprises a chassis coordinate system.

20. A method of evaluating a profile of a work piece, comprising the steps of

Correlating the coordinate space associated with two or more contour sensors with a common coordinate space; and

Generating profile data representing a profile of a predetermined work piece.

21. The method of claim 20 further comprising the steps of:

correlating the coordinate space associated with a reference template with said common coordinate space; and

comparing said profile data with said reference template to determine differences between said profile data and said reference template.

22. A non-contact measurement system comprising a sensor unit configured to determine the diameter of a work piece.

23. The system of claim 22 wherein said sensor unit comprises a detector unit for receiving light reflected from a work piece.

24. The system of claim 23 wherein said sensor unit is configured to generate data representing coordinate values for points along the profile of said work piece based upon received light reflected from said work piece.

25. The system of claim 24 wherein said sensor unit is further configured to determine a diameter of said work piece based upon said received light reflected from said work piece.

26. The system of claim 24 wherein said sensor unit is further configured to determine a diameter of said work piece based upon application of a best fit of a circle of a known diameter to the points represented by said coordinate values.

27. The system of claim 24 wherein said sensor unit is further configured to determine a center point of said work piece based upon application of a best fit of a circle of a known diameter to the points represented by said coordinate values.

28. The system of claim 25 wherein said sensor unit is configured to output data representing the value of said diameter.

29. The system of claim 22 wherein said sensor unit is configured to output data representing the coordinate values for said center point.

30. The system of claim 22 wherein said sensor unit further comprises an illumination unit for emitting light for illuminating a work piece.

31. The system of claim 30 wherein said illumination unit comprises a laser light source.

32. The system of claim 31 wherein said illumination unit comprises a sheet of light laser.

33. The system of claim 30 wherein said sensor unit further comprises a detection unit for receiving light reflected from said work piece.

34. The system of claim 33 wherein said detection unit comprises a charged coupled device (CCD).

35. A method of registering a contour sensor into a predetermined coordinate space comprising the steps of:

receiving data representing the profile of a predetermined target;

determining the X and Y coordinates and center point for said target based upon said received data; and

determining translation parameters based upon said received data and said X and Y coordinates and said center point.